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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/701,479	01/22/2001	Toshiyoshi Yamamoto	46890-466	1182

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EXAMINER

SONG, HOON K

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/701,479

Applicant(s)

YAMAMOTO ET AL.

Examiner

Hoon Song

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Joosten (US 6263044B1),

Regarding claim 1, Joosten teaches an X-ray irradiation unit;

an X-ray image sensor including an X-ray-to-photo conversion device for converting an X-ray radiated from said X-ray irradiation unit to a photo signal for corresponding to an intensity of the X-ray and a photoelectric conversion device for converting the photo signal to an electric signal to output brightness data of an image in a unit of a pixel (column 3 line 1+);

a correction factor setting unit (15, absorption calculating means) for setting a correction factor based on electronic image data of a reference subject (reference substance, column 4 line 27+) provided from said X-ray image sensor which takes an X-ray photograph of the reference subject;

a correction factor storage unit for storing the correction factor set in said correction factor setting unit (well known, computer); and

a controller for correcting the brightness data of the image output from said X-ray image sensor based on the correction factor to output corrected brightness data (column 4 line 4+).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 and 15-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Bruijns (US 5434902) in view of Joosten.

Regarding claims 1, 3, 5, 7 and 9-10, Bruijns teaches an X-ray irradiation unit; an X-ray image sensor including an X-ray-to-photo conversion device for converting an X-ray radiated from said X-ray irradiation unit to a photo signal for corresponding to an intensity of the X-ray and a photoelectric conversion device for

converting the photo signal to an electric signal to output brightness data of an image in a unit of a pixel (abstract);

a correction factor setting unit for setting a correction factor

a correction factor storage unit for storing the correction factor set in said correction factor setting unit (abstract); and

a controller for correcting the brightness data of the image output from said X-ray image sensor based on the correction factor to output corrected brightness data (abstract).

However Bruijns fails to teach that setting a correction factor based on electronic image data of a reference subject (reference substance, column 4 line 27+) provided from said X-ray image sensor which takes an X-ray photograph of the reference subject.

Joosten teaches the setting a correction factor based on electronic image data of a reference subject, tissue equivalent material (column 4 line 28+).

In view of Joosten, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to adopt the correction factor using a reference subject because it is considered useful to determine the absorption of the object relative to the known absorption rate of a reference substance (column 4 line 25+). Accordingly, one would be motivated to set the correction factor because it would provide easy comparison and identification of bones, tissue, blood or artificial objects in the x-ray images (column 4 line 31+)

Regarding claim 2, Bruijn teaches that said correction factor for improvement of picture quality acquired from the brightness data therein for each pixel individually (abstract)

Regarding claim 4, Bruijn teaches that said controller corrects the brightness of each pixel by multiplying a brightness value of said pixel in the image obtained by taking the X-ray photograph of a subject body by said correction factor of the corresponding pixel (abstract).

Regarding claims 6 and 8, Bruijn teaches that said controller corrects the brightness of each pixel by multiplying a brightness value of said pixel in the image by said correction factor of the corresponding pixel (abstract).

Regarding claim 11, Bruijn teaches that a correction factor setting means for setting a correction factor, other than ordinary X-ray photography, in order to acquire said correction factor, wherein said X-ray camera can be operated for resetting a correction factor for improvement of picture quality at an arbitrary timing when said equipment is first installed, when a user determines it necessary.

Regarding claim 15, Bruijn teaches that a thickness of the reference subject is uniform (column 4 line 27+).

Regarding claim 16, Bruijn teaches that a material of reference subject is homogeneous (column 4 line 27+).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joosten in view of Nagai (US 6208710B1).

Regarding claim 14, Bruijn teaches fails to teach that a plurality of X-ray image sensors are arranged in a manner that a portion of an image capture area of each said sensor overlaps with one another.

Nagai teaches the overlapping portion (figure 9).

In view of Nagai, one having ordinary skill in the art would be motivated to adopt the overlapping portion in order to maximize the detectable area of the x-ray sensor array to be same as detectable area of the planar detector (column 3 line 45+).

Response to Arguments

Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claims 12-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 12, none of the prior art fails to teach said correction factor storage unit stores three types of correction factors obtained by dividing each of three values by a brightness value of each pixel, said three values being an average value and a representative value of brightness of an image obtained by taking the X-ray photograph of said reference subject, and a predetermined reference brightness value, and said controller selects one correction factor among said three types of correction

factors when making correction of brightness of the image obtained by taking the X-ray photograph of said reference subject.

Regarding claim 13, none of the prior art fails to teach said correction factor storage means stores two types of correction factors corresponding to a soft-tissue equivalent material and a bone-tissue equivalent material by taking photographs of said two equivalent materials, and said controller selects one correction factor between said two types of correction factors when making correction of brightness of the image obtained by taking the X-ray photograph of said reference subject.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is 703-308-2736. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Hoon Song
June 10, 2003

A handwritten signature in cursive script, reading "David Bruce".

DAVID V. BRUCE
PRIMARY EXAMINER